ESO 161

COMMON MARKET POLICY PROJECT

by

Wallace Barr

REPORT

on

COMMON MARKET POLICY PROJECT
(Includes foreign trade education activities in Ohio Extension program)

by

Wallace Barr, Extension Economist
Ohio State University

to

Mr. Raymond Ioanes, Administrator
Foreign Agriculture Service
United States Department of Agriculture

in

partial fulfillment of
Contract No. 12-29-72-8

8-3-73

TABLE OF CONTENTS

Contract No. 12-29-72-8
F.A.S., U.S.D.A. - Wallace Barr

I. PREFACE

The European Common Market project, conducted in mid-1972, was designed to study EC policies and programs and their impact on U. S. agriculture, particularly for corn and soybeans.

The report will be divided into two broad parts. A report on 1) The situation, causes and implications of the five objectives outlined in the study, and 2) a short resumé on incorporation of the observations into the Ohio Extension education program on foreign trade and policy.

The report will be designed to highlight land use shifts with emphasis on cereals and corn in the EC and United Kingdom and the substitution of by-products for grains in the EC and new entrants. With these constraints, the reporting under certain objectives will be very selective, brief and far from complete or exhaustive. These many impressions and observations, personally very useful, will be omitted from the report.

II. REPORT OF FINDINGS

The Common Agricultural Policy (CAP) was initiated in 1962 with each country systemically adjusting their prices upward or downward until the EC achieved a unified price system in 1967. The cereal grain prices in the EC are supported far above those in the U. S. and most of the world. Thus, they developed a variable levy system to protect their farmers from imports. In this system, excess production of supported items becomes eligible for export subsidies that move products into world markets in competition with other suppliers. For example, wheat is not only eligible for export subsidies but also is moved into EC feed grain markets through a denaturing process and payment. This increases domestic EC feed grain supplies and reduces the need for imported feed grains.

A. CHANGING EC AGRICULTURAL POLICIES AND PROGRAMS

U. S. exports of farm products to the original six countries in the Common Market (EC) totaled $2.1 billion in 1972--a substantial growth from the $1.2 billion in 1962. The composition of that trade has changed with lower sales in 1972 of wheat, lard, poultry and egg products than in 1962 when the EC started adjusting to a unified farm price policy.

U. S. feed grain exports since 1962 to the six have fluctuated and ranged from the 1966 peak of $476 million to the low of $225 million in 1969. Almost all of the increase in farm exports to the EC are non-variable levy items with oilseeds and products being the major beneficiary.

At the same time the EC output of feed grains, especially corn, has been rising rapidly. These conditions, plus an expanded EC from six to nine countries, may foretell a decline in U. S. corn exports. The nine EC countries combined have been by far the biggest world market for feed grains and soybeans.

EC Price Policy Shifts

Shifts in policy emphasis can be partially ascertained by comparing EC price targets, orientation prices and intervention prices (Table 1). The intervention price is the basis for determining the variable levy with provisions for adjustments for seasonal and locational factors. Support prices for commodities to producers are a little below the intervention prices shown.

Target barley and corn prices were increased 14 and 12 percent, respectively, from the unified 1967 level to 1972-73 with further increases programmed for 1973-74. The absolute and percentage increase are both greater than for wheat. Production shifts result from differentials in net income between alternative crops considering yields, costs and prices. The price change would seem to favor corn.

The orientation price for veal in all years far exceed those of pork or beef. Beef orientation prices have increased more rapidly than pork and in 1973-74 will exceed pork. Of additional importance, the absolute difference between veal and beef are narrowing and should improve the returns from beef relative to veal. These significant policy changes reflect a growing desire to encourage beef output.

Table 1. FIXED PRICES IN E.C. PER 1000 KG OR METRIC TON

Price Nature	1967 Amount	1971-72 Amount	1971-72 % Change From 1967	1972-73 Amount	1972-73 % Change From 1967	1973-74 Amount	1973-74 % Change From 1967
		(Unit of Account/Metric Ton)1/					
Wheat (Soft)							
Price Target	106.25	109.44	3.0	113.80	7.1	114.94	8.2
Intervention	98.38	100.72	2.4	104.75	6.5	105.80	7.5
Barley							
Target	91.25	100.21	9.8	104.25	14.2	105.29	15.4
Intervention	85.00	92.02	8.3	95.70	12.6	96.66	13.7
Corn							
Target	90.63	96.90	6.9	101.75	12.3	102.77	13.4
Intervention	77.00	79.31	3.0	83.25	8.1	N.A.	--
Milk							
Target	103.00(1968)	109.00	5.8	117.70	14.3	124.20	20.6
Beef							
Orientation	680.00(1968)	720.00	5.9	780.00	14.7	862.00	26.8
Veal							
Orientation	915.00(1968)	942.50	3.0	965.00	5.5	1,037.50	13.4
Pork							
Orientation	735.00	800.00	8.8	825.00	12.2	860.00	17.0

Kilogram = 2,204 lbs.; metric ton = 2,204.6 lbs.

1/ Unit of account prior to 1971 was $1.00; today $1.206 per unit corrects for devaluation.

SOURCE: Foreign Agricultural Trade of the U. S., ERS, USDA, May, 1973.

Milk prices have increased substantially which has encouraged milk output and an accumulation of surplus butter in the EC. A major way for EC farmers to take advantaged of the veal-beef-milk prices increases is to expand cattle numbers. This increases not only feed requirements, but also means additional demand for more pasture and roughage.

Enlargement

The EC expanded its membership in early 1973 when Denmark, Iceland and the United Kingdom joined the original six countries of Belgium, France, Italy, Luxembourg, the Netherlands and West Germany. Negotiations provided that the full variable levy be adopted toward third-country imports with internal arrangements for intra-EC trade. Each of the new members agreed to adjust their domestic agricultural support prices in six steps to reach the EC level as of January 1, 1978.

- - IN THE SIX

Expanding Use of Grain For Feeding

In the original six EC countries, human consumption of all cereal grains for food and drink has remained near 30 million metric tons for over a decade (Table 2). The growing demand for more meat and poultry products has meant a large increase in livestock and poultry numbers. Shifts in the kind of livestock, improved feeding practices and increased rate of feeding per animal have contributed to increasing amounts of grain fed. As a result, total use of cereals

for livestock and poultry feed reached 49 million metric tons--an increase of 16 million metric tons or 21.5 percent from the 1960-62 period to 1972. Out of the available supply of 80 million metric tons of cereal grains (after balancing for imports and exports) the livestock and poultry industry in the six EC countries today uses 61.5 percent of the total available cereal grains. Back in 1960-62, about half of the 63 million tons of available cereals were used by livestock.

Table 2. GRAIN PRODUCTION AND USE, EC SIX, 1960-62/1972

Fiscal Year	Production	Net Imports	Total Consumption[1/]	Feed Consumption	Food Consumption & Other
			(1000 Metric Tons)		
1960-62	51,870	10,700	63,251	33,125	30,127
1963	57,756	9,745	64,878	35,134	29,744
1964	56,706	9,447	67,627	38,075	29,552
1965	59,431	7,275	68,357	38,658	29,699
1966	60,206	11,427	70,172	39,958	30,214
1967	57,984	11,893	70,963	40,983	29,980
1968	68,157	10,290	74,593	44,154	30,439
1969	69,712	7,387	74,534	44,383	30,151
1970	69,852	2,884	76,766	46,365	30,401
1971	66,804	9,951	77,356	46,755	30,601
1972	76,149	3,898	80,236	49,281	30,955
Average	61,413	8,945	70,402	40,239	30,163
% Change 1972/1960-62	+18.4	-16.4	+11.3	+21.5	+.01

1/ Change of stocks not shown
SOURCE: Grain and Feed Division, F.A.S., USDA, October, 1972

The production of grains in the EC has trended upward, though unevenly, throughout the 12-year period (Table 2). The increased output from 1960-62 through the good 1972 crop year was 24,329,000 tons. The EC production has been increasing a little more rapidly than use making them slightly less dependent upon other countries for feed grains.

B. AGRICULTURE IN THE SIX

The structure of EC agriculture and farm policies encourages livestock and poultry production. Rapidly rising incomes have generated a strong demand for high-protein foods, such as red meat, broilers and eggs. EC farmers have responded to these demands by expanding output. These shifts get reflected in land use changes.

Farms are relatively small and often unsuited to crop mechanization. They need to more fully employ the available labor. Many farmers are relatively old

and others are part-time farmers. About 60 percent of the EC farms produce milk and other than in the Netherlands and isolated instances in other EC countries, milk is produced in very small-sized dairy units. Cattle numbers in the EC have been increasing.

Improved producer prices and income possibilities come from rapidly expanding consumer demand for beef and rising EC support prices for beef, milk and milk products. European cattle are predominantly dual purpose breeds, so beef production and milk are closely tied together. EC policy changes encouraging a shift from milk to beef type cows were initiated in 1973.

C. SHIFTING LAND USE IN THE SIX

Non-farm use of land has expanded in the original six EC countries. Farmland has been lost to urban areas through highway, airport, plant and housing construction plus other uses associated with urbanization and industrialization. Expanding cities and other non-farm uses of land has resulted in a lost of over 2.5 million hectares or 3.5 percent in the amount of land used for agricultural purposes (excluding forestry) in the decade of the 1960's (Table 3). The average annual decline was 316,622 hectares.

Table 3. ARABLE AND PERMANENT PASTURE LAND USE IN THE EC SIX, 1960-70

Year	Total Agr. Land	Permanent Pasture	Crop Land
1960-62 Average	72,501.2	25,911.2	46,590.0
1963	71,955.9	25,938.7	46,057.2
1964	71,685.5	26,074.0	45,611.5
1965	71,322.3	26,314.4	45,007.9
1966	71,060.0	26,503.3	44,556.7
1967	70,772.4	26,717.7	44,054.7
1968	70,161.0	26,652.1	43,508.9
1969	70,129.0	26,738.2	43,390.8
1970[1/]	69,968.0	26,711.0	43,257.0
Average	71,323	26,307	45,019
% Change 1970/1960-62	96.5	103.1	92.8

SOURCE: Statistique Agricole, 1968-No. 1, 1968-No. 8, 1971-No. 4.

1/ Preliminary.

More Land Used for Permanent Pasture In The Six

Permanent pasture land increased 800,000 hectares to 26,711,000 in 1970 and utilized 38.2 percent of the total land devoted to agriculture, excluding forestry (Table 3). This compares to 25,911,200 hectares or 35.7 percent in the 1960-62 base period. The expansion in permanent pasture acreage is widely dispersed in the EC and is due to many interrelated factors dealing with structure, price policies and shifting demand.

In addition, permanent pasture improvement practices like fertilizing, liming, clipping, draining, etc., have not been widely practiced, except in the Netherlands. Thus, more land has been needed to expand cattle numbers and output. Recent CAP policies raising livestock orientation prices substantially reveals an increasing emphasis on livestock production. Rising beef prices and higher support prices for milk may further encourage expansion of permanent pasture acreage. In the longer run, it may encourage increased carrying capacity per hectare through better management and cultural practices on the limited land area.

Less Land For Crops

Expanding use of land for urban development and permanent pasture in the EC has resulted in 3.3 million fewer hectares, or a seven (7) percent decrease in the amount of land available for the production of crops since 1960-62 (Table 4). EC support policies favor grains and has held the area devoted to cereal grain production to a very small decrease. Large declines have occurred in root and tuber crops, pulses and industrial crops with smaller declines in hay and fruit, vegetable and other crops.

Table 4. CROP LAND USE PATTERNS IN THE EC SIX, 1960-70

	Crop Land	Hay Crops	Total Grains 1/	Fruits Vegetables & Others 2/	Roots & Tuber Crops 3/	Other 4/
	(1,000 Hectares)					
1960-62 Average	46,590.0	10,456.9	21,301.6	8,118.2	5,350.1	1,363.9
1963	46,057.2	10,444.4	20,993.3	8,175.4	5,126.2	1,317.9
1964	45,611.5	10,239.7	21,064.9	8,204.7	4,807.7	1,294.6
1965	45,007.9	10,081.9	21,039.5	8,116.1	4,528.4	1,240.0
1966	44,556.7	10,144.9	20,761.5	8,167.1	4,282.1	1,201.4
1967	44,054.7	9,808.8	20,673.5	8,157.7	4,246.1	1,168.2
1968	43,508.9	9,341.3	20,924.4	7,967.4	4,110.9	1,164.9
1969	43,390.8	9,368.5	21,048.1	7,914.1	3,849.2	1,210.9
1970 6/	43,257.0	9,635.0	20,949.0	7,629.0	3,809.0	1,235.0
Average	45,019	10,039	21,032	8,062	4,619	1,265
% Change 1970/1960-62	92.8	92.1	98.3	94.0	71.2	89.8

1/ Does not include area that has more than one crop per year
2/ Includes olives, grapes, nurseries, etc.
3/ Root and tuber crops including potatoes, sugarbeets, forage beets, other cultivated forage crops.
4/ Includes pulses, industrial crops like rapeseed, other oilseeds, flax, hemp, tobacco, hops, etc.
5/ One hectare equals 2.471 acres.
6/ Preliminary.
SOURCE: Statistique Agricole, 1968-No. 1, 1968-No. 8, 1971-No. 4.

Hay crops declined 822,000 hectares or eight (8) percent from 1960-62 to the 1970 period. A major substitute for both hay and forage root crops has been corn silage. Corn silage has been attractive because it has relatively high yields, is nutritionally adequate, is easily handled by mechanical equipment and is less demanding of hand labor.

More Land Used for Corn and Barley in EC Six: Less for Other Cereals

The amount of land devoted to wheat in 1971 totaled 9,830,000 hectares, 693,000 or seven (7) percent fewer than in 1960-62 (Table 5). Coarse grains in 1971 utilized 11,191,000 hectares, 160,000 or 1.5 percent more than in the 1960-62 base period. However, the area producing barley and corn increased by 1,568,000 hectares, and came largely from replacing oats and rye and mixed winter grains. These crops decreased 1,398,000 hectares accounting for 89 percent of the total decline. The small remainder would be from root and tuber crops, hay or wheat.

Table 5. AREA OF WHEAT AND COARSE GRAINS HARVESTED, EC SIX, 1960-71

Year	Cereals	Wheat	Coarse Grains				
			Total	Barley	Corn	Oats	Other 1/
			(1,000 Hectares) 2/				
1960-62 Average	21,554	10,523	11,031	3,686	2,067	2,852	2,426
1963	21,279	9,975	11,304	4,129	2,086	2,701	2,488
1964	21,346	10,632	10,714	3,934	1,983	3,084	1,713
1965	21,254	10,626	10,628	4,064	1,925	2,960	1,679
1966	20,981	10,037	10,944	4,401	1,981	3,014	1,548
1967	20,819	9,728	11,121	4,581	2,072	3,014	1,454
1968	21,122	10,209	10,913	4,562	2,048	2,888	1,415
1969	21,185	10,119	11,066	4,691	2,265	2,828	1,282
1970	21,127	9,720	11,407	4,901	2,610	2,653	1,243
1971 3/	21,021	9,830	11,191	4,620	2,691	2,644	1,236
Average	21,233	10,204	11,032	4,245	2,155	2,862	1,778
% Change 1971/1960-62	97.5	93.4	101.5	125.3	130.2	92.7	50.9

NOTE: The data for "other grains" before 1964 includes mixed summer and winter grains; from 1964 onward these mixed summer grains are counted under oats and other mixed winter grains under rye.

1/ Other includes rye, mixed winter grains, sorghum, etc.

2/ One hectare equals 2.471 acres.

3/ Preliminary.

SOURCE: Production Vegetale, 1968-No. 14, Production Vegetale, 1972-No. 6.

Barley was grown on 4,620,000 hectares in 1971, or 25 percent more than in 1960-62. Most of the increase in the amount of land devoted to barley occurred prior to unification of EC grain prices in 1967. Since that time,

the land devoted to barley has fluctuated between 4.6 to 4.9 million hectares.

The most dramatic shift is the increase in corn acreage. In 1971, corn was harvested from 2,691,000 hectares or 30 percent more than in 1960-62. But all of the increase has occurred since 1967. EC farmers have been "spurred" to produce more corn since the adoption of unified EC grain prices in 1967. Rising demand for feed grains and support prices for corn provided the incentive to develop new hybrids that permitted expansion of the land devoted to corn. Formerly corn for grain was confined to southern France and Italy. Today, corn for grain is grown as far north as Belgium, making France a major corn producing country.

Yields of Cereals In EC Six

The average yield of all cereals (rice excluded) improved from 2.5 tons per hectare in 1960-62 to 3.65 tons in 1971 (Table 6). This was a 46 percent increase. A big boost in yields occurred in 1967 and coincides with the final adjustment to uniform cereal grain prices within the six original EC countries. However, yields have been maintained or improved since 1967. Thus, higher prices weren't the only favorable factor bringing about higher cereal yields. Contributing to the producer response would be price and market certainty reducing risk that encouraged rapid adoption of improved varieties and expanded use of fertilizer and chemicals. Bigger farms that could more readily mechanize were additional factors improving yields.

Table 6. AVERAGE YIELDS PER HECTARE FOR WHEAT AND COARSE GRAINS, EC SIX, 1960-71

Year	All Cereals	Wheat	Coarse Grains				
			Total	Barley	Corn	Oats	Other
	(Metric Tons/Hectare)1/						
1960-62	2.50	2.44	2.56	2.72	2.94	2.19	2.44
1963	2.69	2.46	2.88	2.93	3.65	2.45	2.51
1964	2.81	2.75	2.86	3.02	3.09	2.50	2.87
1965	2.85	2.87	2.83	2.94	3.55	2.49	2.20
1966	2.79	2.64	2.92	2.84	4.02	2.55	2.44
1967	3.30	3.22	3.35	3.50	3.96	2.91	2.97
1968	3.33	3.18	3.44	3.37	4.72	2.93	3.10
1969	3.33	3.12	3.49	3.38	4.70	2.98	3.09
1970	3.19	3.05	3.28	2.88	4.92	2.68	2.91
1971	3.65	3.48	3.77	3.45	5.15	3.15	3.33
Average	2.95	2.84	3.04	3.01	3.88	2.60	2.73
% Change 1971/1960-62	146	142.6	147.3	126.8	175.2	143.8	136.5

1/ Metric Ton = 2,204.6 pounds; hectare = 2.471 acres.
SOURCE: Production Vegetale 1968-No. 14, Production Vegetale, 1972-No. 6

Wheat yields in 1971 were slightly below the EC average of 3.65 tons for all cereal grains, but increased a very substantial 43 percent in the decade. Barley yields in 1971 averaged 3.45 metric tons per hectare, but increased only 27 percent from 1960-62. Barley yields were below the 3.65 ton average for grains in 1971.

Corn yields have improved dramatically. In 1971, corn yields were far above other cereal grains averaging 5.15 metric tons per hectare (81.1 bushels per acre). The 75 percent improvement since 1960-61 in corn yields were two-thirds greater than any other cereal. Especially significant is that corn was the only crop exceeding the average yield each year since 1960-62; also, the gap between corn and other grain yields continues to widen. The big yield increase was due to many factors. But playing a major role was the development of hybrid seed varieties that not only increased yields, but also expanded the area in which corn could be grown.

EC Six Corn Production

Corn has gained a major place in EC agriculture with the area increasing 30 percent (624,000 hectares) and yields going up 75 percent (2.21 metric tons/hectare) from 1960-62 to 1971 (Table 7). Corn output at 13,852,000 tons in 1971 represented one-third of the total coarse grain production; while in 1960-62, corn was one-fifth of the total coarse grain output.

Table 7. CORN AREA, YIELDS AND OUTPUT IN FRANCE, ITALY AND EC SIX, 1960-62, 1967 and 1971

	Hectares		Yield		Production	
	No.	Percent of EC	Ave.	Percent of EC	Amount	Percent of EC
	(1000 Ha.)		(m.t./Ha.)			(1000 m.t.)
France						
1960-62	888	43.0	2.70	92.2	2,382	39.1
1967	1,013	48.9	4.11	103.8	4,162	50.8
1971	1,636	60.8	5.36	104.1	8,771	63.3
1971/1960-62;%	84.2	--	98.5	--	368.2	--
Italy						
1960-62	1,168	56.5	3.14	106.8	3,671	60.3
1967	1,017	49.1	3.80	95.6	3,860	47.1
1971	936	34.8	4.77	92.6	4,469	32.3
1971/1960-62;%	-19.9	--	51.9	--	121.7	--
EC						
1960-62	2,067	100.0	2.94	100.0	6,085	100.0
1967	2,072	100.0	3.96	100.0	8,198	100.0
1971	2,691	100.0	5.15	100.0	13,852	100.0
1971/1960-62;%	30.2	--	75.2	--	227.6	--

SOURCE: Trends in World Grain Production, 1960-72, FAS, USDA, February, 1973.

Italy's Declining Role in Corn Production

In 1960-62, Italy produced 3,671,000 metric tons or 60 percent of all EC corn (Table 7). In 1971, the Italians produced 4,469,000 tons or 22 percent more than 1960-62, but this was only about one-third of the EC corn output. Yields in Italy averaged 4.77 tons per hectare in 1971 which is a substantial improvement over the 3.14 ton average in 1960-62. New hybrids were a major contributing factor to increased yields.

Even with improved yields, the area devoted to corn in Italy has declined nearly 20 percent since 1960-62. Among the reasons for Italy's declining EC role in corn production are: 1) limited ability to irrigate more land, 2) increasing competition from fruits and vegetables for available arable land, 3) small fragmented farm units that impede mechanization, 4) policy emphasis on the fed cattle industry encouraging the production of corn silage rather than corn for grain, and 5) the variable levy exemption on imported corn in Italy at $7.50 per metric ton below other EC countries.

France's Expanding Role in Corn Production

France's emergence as a major corn producing nation is of recent origin. The interest in corn was accelerated by implementing relatively high support prices encouraging the development of shorter season and higher yielding hybrids that permitted corn to be grown in the rich Paris Basin where favorable farm size and structure was conducive to rapid expansion. Yields in France have doubled since 1960-62 (Table 7). The corn area has expanded at over eight (8) percent per year. The result is that in 1971, France produced 8,771,000 tons of corn, an amazing 3.7 times more than in 1960-62. This was nearly two-thirds of the EC total making France self sufficient and an exporter of corn, mostly to other EC countries.

The expansion in land devoted to any crop accelerates as profitability improves relative to other alternatives. Corn in the EC, particularly in France, is an excellent example. A thumb rule for approximating equal net returns per hectare in 1972, considering the prevailing prices and costs in the EC for wheat, barley and corn, was a yield ratio between the crops of 1:0, 1:05; to 1:25. Expressed another way, approximately equal net returns could be expected from yields of 4.0 metric tons per hectare of wheat, 4.2 tons of barley and 5.0 tons of corn. Average yields in France for these three cereals in 1971 were 3.38, 3.35 and 5.36 tons per hectare which gives a ratio of 1:0; 0:87; to 1:39. The advantage in cereal production clearly lies with corn. This will be especially true where farm size and climate are conducive to corn production.

Further expansion in the amount of land used in France for corn is anticipated. Corn yields are expected to continue to improve relative to other cereals. EC price policies are expected to continue to encourage corn production. Expanding the corn producing area in France will come largely at the expense of oats, rye and barley. Also, corn silage acreage has expanded by leaps and bounds and has replaced root crops and rotated hay land. Continued substitution encouraging further expansion of silage for root and rotated hay crops is expected because EC price policies should accelerate the expansion in cattle numbers.

Total Cereal Output In The Six

The net effect of changes in yields and land devoted to cereals is that total production of wheat and coarse grains in the EC during the crop year of 1971 reached a record of 77 million metric tons or 42 percent above the 54 million tons produced in 1960-62 (Table 8). This was reached even though there was a small 2.5 percent decline in the total area devoted to wheat and coarse grains.

Table 8. PRODUCTION OF WHEAT AND COARSE GRAINS, EC SIX, 1960-71

Year	Total	Wheat	Coarse Grains				
			Total	Barley	Corn	Oats	Other 1/
	(1,000 Metric Tons) 2/						
1960-62	53,947	25,670	28,277	10,024	6,085	6,237	5,931
1963	57,164	24,582	32,582	12,116	7,613	6,608	6,245
1964	59,907	29,289	30,622	11,869	6,127	7,706	4,920
1965	60,610	30,485	30,125	11,950	6,835	7,638	3,702
1966	58,500	26,526	31,974	12,482	7,970	7,751	3,771
1967	68,630	31,332	37,299	16,019	8,198	8,757	4,325
1968	70,289	32,414	37,891	15,383	9,660	8,462	4,386
1969	70,451	31,548	38,904	15,873	10,646	8,426	3,956
1970	67,356	29,678	37,676	14,100	12,852	7,103	3,621
1971 3/	76,767	34,232	42,535	16,107	13,852	8,460	4,116
Average	62,626	28,925	33,703	12,998	8,500	7,469	4,720
Percent 1971/1960-62	142.3	137.9	150.4	160.7	227.6	135.6	69.4

NOTE: The data for "other grains" before 1964 includes mixed summer and winter grains; from 1964 onward these mixed summer grains are counted under oats and other mixed winter grains under rye.

1/ Other includes rye, mixed winter grains, sorghum, etc.

2/ One metric ton equals 2,204.6 pounds.

3/ Preliminary.

SOURCE: Production Vegetale, 1968-No. 14, Production Vegetale, 1972-No. 6

Wheat output has increased slightly and averaged nearly 29 million tons in the 1960-71 period. Coarse grain output has grown at an annual rate of 5.6 percent per year. Barley output has increased at an average annual rate of 6.7 percent per year. Corn production has more than doubled increasing at an annual rate exceeding 14 percent.

All the evidence would indicate a continuation of the upward trend in feed grain output and stabilization of wheat output.

Some Impacts

In considering the impacts on the U. S. grain trade, the increase in feed

grain output could be fully utilized in the EC Six. The U. S. has been a residual supplier. The trade balance might be relatively unchanged with strong EC demand for meat, especially for beef. A further shift toward more hogs and poultry plus grain feeding of cattle could expand the need for feed grains. But with the capacity to expand feed grain production in the EC and unless CAP policies for cereals are changed, the opportunity for expanding U. S. feed grain markets in the EC will continue to be severely limited. Offsetting to some U. S. producers will be much greater need for soybeans and soybean products to meet the need for protein food and feed requirements in the EC. The U. S. is the world's major supplier of soybeans and further large increases in soybean output will be required to meet European and world needs.

- - IN THE UNITED KINGDOM

Entry into the European Community (EC) in January, 1973, means that Denmark, the Netherlands and the United Kingdom will move gradually to much higher prices for many farm products. EC policies mean shifts in production of crops and livestock as well as origin of imports and destination of their exports. This portion will discuss corn and cereal output in the United Kingdom only. This is due to the fact that no corn is produced in Denmark and Ireland.

In addition, the United Kingdom has been a leading customer for U. S. farm products. Last year, British buyers purchased nearly $85 million worth of U. S. feed grains of which about $80 million was corn. In 1972 the United Kingdom ranked as the sixth largest U. S. market for corn. Feed grains represented 18 percent of their $481 million spent for U. S. farm products.

D. SHIFTING LAND USE AND CEREAL PRODUCTION IN THE UNITED KINGDOM

There have been widely divergent views on the shifts in United Kingdom agriculture upon adjustment to EC policies. One school of thought holds that very little change in the United Kingdom cereal output will occur and likely will remain in the 13 to 15 million long ton (2,240 pounds) range. At the other extreme are those that feel a big increase in cereal output will occur in response to higher EC grain prices.

This analysis reflects the author's judgment in arriving at a "consensus" view. The major focus will be on potential corn for grain production in the United Kingdom. To provide sufficient basis for understanding some of the potential effects of the United Kingdom joining the EC, a brief assessment of arable land use patterns and shifts in cereal acreage, yields and output will follow.

United Kingdom Corn Production Experiences

Corn production in the United Kingdom is very small though expanding rapidly. Corn silage was grown on 10,000 acres in 1972, mostly in the Southeastern part of Britain. Use has been spreading north and west. Corn for silage is substituting for rotation grass crops since yields of 4 to 6 tons per acre on a dry matter basis compare very favorably.

For grain harvest in 1970, only about 1,000 acres of corn were planted;

in 1971 some 2,000 acres; and in 1972, about 4,000 acres were planted. Corn yields have approached 2 long tons (80 bushels) per acre though some producers have harvested 3 tons. Learning the production techniques and shifting corn to the best land on each farm have been major factors in improving yields.

Net returns, considering yields, costs and prices, are such that some producers in Southeast England find corn for grain the second most profitable cereal crop. On these farms corn follows wheat and is ahead of barley in profitability. Limited data from Wye College indicates gross margins in 1972 on an 88 bushel per acre corn crop priced at $1.875 per bushel (lower than EC prices) are near $75 per acre when commercial drying and storage are used (Table 9). Net returns from $15 to $25 per acre would be expected if $50 to $60 fixed costs per acre are assumed. Producers with 120 bushels per acre would have more favorable net returns which acts as a further incentive to increase acreage of corn for grain.

Table 9. PARTIAL BUDGET ON CORN PRODUCTION IN UNITED KINGDOM, 1972

	Off-Farm Storage		Farm Storage	
GROSS RECEIPTS PER ACRE:				
Yield:				
88 Bushels @ $1.875				$165.00
COSTS PER ACRE:				
Materials:				
Seed	$11.25			
Fertilizer	19.25			
Spray	8.00			
		$38.50		
Propionic Acid			$5.00	
				$43.50
Services:				
Drilling	$ 2.50			
Combine	17.50			
Hauling	3.25			
Drying	27.50		$12.50	
		$50.75		$35.75
Total Variable Costs		$89.25		$79.25
GROSS MARGINS:				
Exclusive of Fixed Costs		$75.75		$85.75

Conversion Rate = $2.50

SOURCE: Approximation secured from Mr. D. Sykes, Farm Management, Wye College, Wye, United Kingdom.

Expansion of corn production has been encouraged with prospective United Kingdom entry into the EC where corn prices receive price supports like barley and wheat. In addition, the government is interested in alleviating the United Kingdom balance of payments problem, and avoiding the import duties on 3.0 to 3.5 million tons (120 to 140 million bushels) of corn imported, of which half to two-thirds usually comes from the U. S.

British corn producers have some barriers to overcome arising from their climatic conditions. The general lack of a sunny and warm growing season makes it difficult to mature a corn crop with present varieties. They must harvest corn at 40 percent moisture content; this is expensive and is a harvesting bottleneck. To afford the combine and farm dryer a minimum of 150 acres are required to have a viable corn producing unit. This is possible since United Kingdom farms are relatively large. Research grants are designed to improve cultural, harvesting and storage practices for corn for grain.

Corn Expected to Increase In United Kingdom

It appears that acreage of corn for grain may increase in importance as a cereal crop in Southeastern England though a bad growing season may slow down expansion. Producers have found corn to be not only a profitable crop but also a crop that improves labor distribution, is easy to handle, improves grass and weed control, has few diseases, and is a useful break crop.

There is a potential for increased acreage of corn for both grain and silage. Climatically about 2,000,000 acres could grow corn for grain; more for silage. However, competition from other crops, agronomic practices, and difficulties enumerated earlier are deterrents. Many felt corn for grain acreage at the end of this decade may reach 200,000 acres. The range of estimates was from 100,000 to 500,000 acres. Increased corn for grain acreage must come largely at the expense of oat and barley acreage. Substitution for barley is associated with disease, rust, insect and weed problems making corn more profitable. Some shift from rotated grass to corn for grain may occur.

With rapid acreage expansion by inexperienced farmers average corn yields may remain near the 2 ton or 80 bushel per acre level. If this occurs on 200,000 acres, the total output of corn may reach 400,000 tons by the end of this decade. The 400,000 tons is about 2 percent of total cereal output. Assuming this output and continued needs of 3.0 to 3.5 million tons of corn, the United Kingdom would grow 11 to 13 percent of their corn requirements.

Shifts In Cereal Grain Acreage In United Kingdom

The amount of arable land in the United Kingdom according to the 1971 census was 17,857,000 acres or 525,000 fewer than 1964 (Table 10). Within the arable land area the acreage devoted to all cereal grains increased by 952,000 acres or 11.2 percent in the 1964-71 period. This is an average increase of 1.4 percent per year in grain acreage. The larger cereal grain acreage came from 1,105,000 acres shifted from temporary or rotation grassland and a reduction in all other crops of 372,000 acres. The major declines in other crops were in potatoes and fodder crops.

The land area devoted to grain crops in 1971 totaled 9,416,000 acres or 53 percent of all the arable land. This compares to 46 percent in 1964 when 8,464,000 acres were used to produce cereals. In this eight-year period, the biggest acreage devoted to cereals was in 1967 when 9,443,000 acres were grown.

Table 10. ACREAGE OF ARABLE CROPS IN UNITED KINGDOM, 1964-71

Year	Arable Land	Wheat	Barley	Oats	Mixed Grain for Threshing	Rye	Total Grain	Other	Temporary Grassland	Permanent Grassland
					(Thousand Acres)					
1964	18,382	2,206	5,032	1,125	80	21	8,464	3,095	6,823	12,305
1965	18,523	2,535	5,395	1,014	73	18	9,035	2,970	6,518	12,138
1966	18,484	2,238	6,130	907	73	10	9,358	2,893	6,233	12,199
1967	18,325	2,305	6,027	1,012	88	11	9,443	2,975	5,934	12,388
1968	18,241	2,417	5,933	945	112	11	9,418	2,950	5,873	12,195
1969	17,943	2,059	5,962	945	156	9	9,131	3,074	5,738	12,348
1970	17,788	2,495	5,542	929	196	11	9,173	2,915	5,700	12,217
1971	17,857	2,710	5,654	896	140	16	9,416	2,723	5,718	12,172
% Change 1971/1964	-2.9	+22.8	+12.4	-20.4	+75.0	-24.0	+11.2	-15.3	-16.2	-1.1

SOURCE: United Kingdom Annual Census

Shifts in land use have occurred within the cereals group. In the eight-year period, barley acreage increased 622,000 acres or 12 percent and wheat increased 504,000 acres or 23 percent. Of the total increase of 1,126,000 acres in wheat and barly, only 169,000 acres came from a net reduction in oats and other cereal grain acreage. Worthy of note is that barley acreage has declined since 1966. Even so, barley accounts for 62 percent of the total acreage devoted to cereal grains. Apparently some wheat-barley substitution is taking place encouraged by a widening difference in yields per acre favoring wheat (Table 10).

Estimates of people naturally vary on the future expansion in cereal acreage. However, the judgments tended to center around a 5 percent increase after the five-year and six-step adjustment to higher EC prices that started in early 1973. The cereal acreage increase would come largely from less rotation grassland. However, this shift faces substantial competition from an expected growth in an extensive beef industry. Implicit in the estimate were that EC 1971-72 basic support prices for wheat, barley and corn were $100.72, $92.02 and $79.31 per metric ton (2,204.6 pounds) respectively. If a 5 percent increase over 1971 acreage materializes, British farmers would grow about 9,884,000 acres of cereal crops after adjustment.

Cereal Crop Yields In United Kingdom

Yields for all cereal grains in the 1964-71 period averaged 1.49 long tons per acre (Table 11). Average yields for all grains ranged from a low in 1968 of 1.37 tons to a 1971 high of 1.57 tons per acre. Wheat yields averaged 1.62 tons (60.5 bushels per acre) in the eight-year period. Wheat yields have exceeded the 1.49 ton cereal grain average in every year since 1964.

Table 11. YIELDS OF CEREAL GRAINS IN UNITED KINGDOM, 1964-71

Year	Wheat	Barley	Oats	Rye	Cereal Crops
		(Long Tons Per Acre)			
1964	1.69	1.47	1.18	1.19	1.49
1965	1.62	1.49	1.20	1.17	1.49
1966	1.53	1.40	1.21	1.10	1.41
1967	1.66	1.53	1.32	1.09	1.54
1968	1.41	1.37	1.28	1.00	1.37
1969	1.61	1.43	1.36	1.22	1.46
1970	1.67	1.34	1.29	1.18	1.42
1971	1.75	1.49	1.50	1.13	1.57
Average	1.62	1.44	1.29	1.14	1.49

SOURCE: Calculated from Tables 10 and 12

Barley yields seem to be declining. This was widely recognized and was attributed to disease, rust, insect and weed problems. This may be a temporary phenomena that might be overcome by technological developments, particularly new varieties. Oat yields are improving, but the low gross margins relative to other cereals discourage acreage.

In the future, average yields from all acreage devoted to cereal crops may increase slowly encouraged by improved price levels relative to most other products. Some additional shift to wheat seems likely and would tend to improve average yields. Technological developments providing improved varieties and cultural practices may increase both wheat and barley yields. Production of corn for grain will tend to increase average cereal grain yields and output.

Future shifts of grassland to expand cereal grain acreage is at the margin. The low productivity of this land will be a deterrent to increasing average cereal grain yields per acre.

Output of Cereals Expected to Increase In United Kingdom

Total cereal grain output has averaged 13.5 million tons in the eight-year period (Table 12). This output came from average cereal grain yields of 1.49 tons per acre and an average of 9,054,750 acres. Total output has ranged from 12.6 to 14.8 million tons. The two high output years of 1967 and 1971 when output exceeded 14 million tons were due to unusually high yields per acre of 1.54 and 1.57 tons.

Table 12. GRAIN OUTPUT IN UNITED KINGDOM, 1964-71

Year	Wheat	Barley	Oats	Mixed Grain	Rye	Total
			(Thousands of Long Tons)			
1964	3,733	7,404	1,325	101	25	12,588
1965	4,105	8,062	1,213	91	21	13,492
1966	3,420	8,586	1,102	93	11	13,212
1967	3,836	9,242	1,340	117	12	14,547
1968	3,414	8,140	1,205	151	11	12,921
1969	3,311	8,527	1,287	216	11	13,341
1970	4,169	7,410	1,198	253	13	13,043
1971	4,748	8,441	1,346	209	18	14,762
Average	3,842	8,226	1,256	154	15	13,486

NOTE: Long ton = 2,240 pounds
SOURCE: U. K. Annual Census

"Consensus" as to future grain output was that 16 to 17 million tons of cereals would be produced in the United Kingdom by the end of the decade. If attained, this would be an 18 to 26 percent increase over the 13.5 million ton average of 1964-71. This increase can come from increased acreage, improved yields or more likely, some combination of the two.

If cereal acreage expands 5 percent over the 1971 acreage to 9,884,000 acres, an average output of 1.61 to 1.71 tons per acre would be required to produce the expected 16 to 17 million tons of cereal grains. This would require increases in average yield per acre amounting to 10 to 16 percent.

Wheat at 1.62 tons per acre is the only commonly grown cereal crop that

has exceeded the needed average of 1.61 tons per acre (Table 11). Corn has yielded near 2 tons per acre, but would contribute very little to higher average yields since only 200,000 acres may be grown. Barley is the main feed grain. Its highest yield per acre was 1.53 tons in 1967 and has averaged only 1.44 tons. Substantial improvements in barley and wheat yields will be necessary to attain the expected output.

EC support prices have encouraged cereal crop production. This provides the needed incentive to shift some land to wheat and corn and/or improve yields of barley and wheat sufficiently to attain the expected 16 to 17 million ton cereal output.

Some Impacts of Expanding United Kingdom Feed Grain Output

Feed grain production in the United Kingdom will undoubtedly increase in the years ahead in response to improved prices and income. The feed grain output could be fully utilized by increased livestock numbers leaving the trade balance relatively unchanged. On the other hand, there could be a shift toward the production of grain fed livestock giving a boost to the demand for barley and other feedstuffs including corn.

More realistically the entry into the EC of the United Kingdom means less U. S. corn exports. This will come from 1) an increase in British wheat, barley and, to some extent, corn production, 2) increased use of wheat for feed encouraged by the denaturing payment, 3) larger purchases of French corn and feed grains, and 4) increased substitution of non-grain feedstuffs, like manioc, for feed grains in livestock rations. The latter may be tempered by the need for increased proportions of protein and the higher protein costs. In any case, there will be increased need for soybeans and soybean meal mostly from the United States, to meet the food and feed requirements of the United Kingdom.

E. SUBSTITUTION AMONG FEED GRAINS AND OTHER FEEDS IN THE EC AND UNITED KINGDOM

In much of the world, rapidly rising incomes have generated a strong demand for high protein foods for human use such as red meat, broilers and eggs. The increasing demand for livestock and poultry products along with technological developments in feed formulation and increasing commercialization of livestock production has meant: 1) growth in the use of cereals in livestock feeding, 2) growth in the compound feed industry, and 3) shifts in the composition of livestock rations.

Growth in Use of Cereals For Livestock Feed

Shifts in the kind of livestock, improved feeding practices and increased rate of feeding per animal have contributed to increasing amounts of grain fed. As a result, in the original six EC countries total use of cereals for livestock and poultry feed reached 49 million metric tons--an increase of 16 million metric tons or 21.5 percent from 1960-62 to 1971 (Table 13). Out of the available supply of 80 million metric tons of cereal grains (after balancing for imports and exports) the livestock and poultry industry in the six EC countries today uses 61.5 percent of the total available cereal grains. Back in 1960-62 about half of the 63 million tons of the available cereals were used by livestock in the original six. The use of cereals by livestock and poultry in the United Kingdom in 1969-70 amounted to 60 percent of the total

22 million tons of home-grown and imported cereals.[1/]

Growth In the Compound Feed Industry

The compound feed industry of the original six produced 31,966,000 metric tons of mixed feeds in 1970--over 2.5 times the 12,463,000 tons produced in 1960 (Table 13). This is a very high annual rate of growth.

Table 13. COMPOUND FEED PRODUCTION BY SIX E.E.C. COUNTRIES, DENMARK, AND UNITED KINGDOM, 1960, 1965 AND 1970

	1960		1965		1970		Growth %
	Tons	Percent	Tons	Percent	Tons	Percent	1970/1960
	(1,000 Tons)[a/]						
Six E.C. Countries							
Belgium-Lux.	1,553.6	12.5	2,527.0	11.9	4,314.3	13.5	277.7
France	2,217.5	17.8	4,543.5	21.3	6,474.5	20.2	292.0
Italy	800.0	6.4	2,000.0	9.4	3,632.5	11.4	454.1
Netherlands	4,300.0	34.5	5,625.0	26.4	7,850.6	24.5	182.6
West Germany	3,592.5	28.8	6,596.8	31.0	9,727.0	30.4	270.8
Total	12,463.6	100.0	21,292.3	100.0	31,966.9	100.0	256.5
New Entrants							
U. K.	8,646	XX	9,742	XX	10,750	XX	124.3
Denmark	XX	XX	2,630(1964)	XX	2,575	XX	XX

a/ Metric tons in all countries except United Kingdom which is short tons.

SOURCE: Ashby, A. W., Livestock Feed Compounding the 1970's, at 1CAM-CAFMNA-SFT Joint Conference, Pillar Hall, Olympia, London, April, 1970.

Esselman, Dr. W., Development of Future Mixed Feed Consumption in the EEC, European Mixed Feed Congress, Rotterdam, May 19, 1972.

The United Kingdom in 1960 produced 8,646,000 short tons of compound feed. By 1970, mixed feed output was 10,750,000 tons or upon conversion to metric tons 61 percent as much as all the EC countries. United Kingdom growth was 24 percent in the decade. The smaller increase in United Kingdom compound feed output results from having developed at an earlier time a highly sophisticated compound feed industry.

1/ Sturgess, I. M. and Reeves, R., The Potential Market for British Cereals, Home-Grown Cereals Authority, Haymarket House, Oxendon Street, London, SW1Y4EF, p. 1-2.

The growth rate in feed compounding within the original six EC countries varies widely from one to another (Table 13). The Netherlands in 1960 produced 4,300,000 metric tons of compound feed or over one-third of the EC total. Today their portion is about one-fourth. The major efforts of the Dutch in the livestock feed industry from 1960 to 1970 were directed toward both quantitative and qualitative improvement in concentrate rations. Their agriculture is based on a highly integrated farm organizational system.

The other five nations of the EC expanded mixed feed output in the decade at very high rates-- they were catching up with the Netherlands and United Kingdom. Today each has a bigger share of the total EC mixed feed output than in 1960. There is still some catching up to do but it would appear that the very rapid growth phase in feed compounding in most of the countries will now shift into a more normal and slower rate of expansion.

Factors Influencing Rapid Growth

The growing part played by the compound feed industry occurred because of numerous factors. One is that no existing single feed has the precise proportion of nutrients required to meet the needs of any species of livestock. Also, farmers have difficulty in mixing feedstuffs on the farm which are properly balanced and the cheapest. The cheapest feedstuff criteria becomes a very significant factor given the Common Agriculture Policy (CAP) of the EC and differences in transportation costs between regions of the EC.

In the EC increasing livestock and poultry numbers and increasing quantities fed per head of livestock contributed heavily to the demand for compound feed. Another factor is the substitution of mixed feeds for farm-grown grains and various fodders--particularly fodder beets and other root crops. Partially offsetting is improved performance of converting feed to meat or livestock and poultry products.

The rapid growth of the EC compound feed industry and changes in the United Kingdom are connected with construction of larger plants than can take advantaged of scale economies and the great strides in the use of the computer to attain the best technical results at the least cost.

The location of plants varies from port sites or on canals in cereals deficit countries like the Netherlands, Belgium, West Germany and Ireland to interior sites in the grain growing regions of France.

In the United Kingdom 47 percent of the total compound feed output is now produced in interior plant locations compared to one-third just ten years ago.[2/] This shift can be attributed to locating plants close to the cereal growing and livestock producing areas as home-grown cereals replaced imported grains.

Where large quantities of cereals are grown, the livestock producers

---

2/ Sturgess, I. M. and Reeves, R., Ibid, p. 3-15.

tend to buy a larger proportion of high protein concentrates to mix with home-grown cereals rather than a completely mixed feed.

Shifts in The Composition of Livestock Rations

In the EC countries there has been a big shift toward the use of proportionately less grain, more protein and more by-product feeds in the concentrate ration of livestock and poultry (Table 14). The biggest shifts in the composition of a nation's livestock ration from 1960-62 to 1970-71 was in the Netherlands. There the proportion of grain used declined sharply from 65 percent of the total concentrates fed in 1960-62 to 34 percent in 1970-71. At the same time the proportion of protein materials increased nearly one-third and the by-product feeds more than doubled. The absolute quantity of cereals used in compound feeds during the decade has increased in each country, except the Netherlands.

Table 14. APPROXIMATE PERCENTAGES OF CEREALS, PROTEIN & OTHER PRODUCTS IN THE CONCENTRATE RATION IN E.C. 1960-62 AND 1970-71 AND DENMARK, IRELAND & UNITED KINGDOM IN 1970-71

	Grain		Protein		By-Products[a]	
	1960-62	1970-71	1960-62	1970-71	1960-62	1970-71
	(Percent)					
E.C. Countries						
Belgium-Lux.	61	42	20	23	19	35
France	54	57[b]	22	25	24	18[b]
Italy	65-70	60-65	20	25	10-15	10-15
Netherlands	65	34	16	21	21	45
West Germany	50[c]	41	28[c]	35	22[c]	24
New Entrants						
Denmark	XX	79	XX	15	XX	6
Ireland	XX	77[d]	XX	9[d]	XX	14[d]
U. K.	XX	73	XX	10	XX	17

a/ Includes cereal offals, molasses, manioc, fats, dehydrated alfalfa, dried pulps and other processing residues, minerals and vitamins.
b/ Decline in use of by-product, bran, accounts for the shifts.
c/ 1957-61 rather than 1960-62.
d/ Two-year average of 1969-71.
SOURCE: Estimated from country data.

All other countries, except France, show the same trend but not the magnitude of change as the Netherlands. In France, the decline in the use of bran, a cereal offal, for livestock feed accounts for the reduction in by-product use. It was replaced by grain in the French livestock and poultry rations.

The approximate composition of the livestock and poultry ration in Denmark, Ireland and United Kingdom in 1970-71 is in sharp contrast to that of the EC. The proportion of grain at 73 percent or more in these three countries far exceeds the levels that exist in the EC countries today, or for that matter, prior to the initiation of the common agricultural policy in 1962. With a high proportion of cereals the protein and by-product content of the rations in these three countries must be relatively low.

The cereal proportions in the concentrates fed to livestock may vary considerably from one species of livestock or poultry to another. This is due to biological, nutritional or consumer behavior constraints. The degree of substitution of by-products for cereals may vary the widest for cattle, more narrowly for pigs and still less for poultry. The production of yellow flesh chickens provides the least opportunity to substitute cereal because of the need for yellow corn.

The explanation of shifts in the composition of the concentrate does not lie entirely with the type of livestock. Denmark emphasizes pork production and has a poultry and cattle industry. Ireland emphasizes cattle using their abundant grass, and has a small pork and poultry industry. The United Kingdom emphasizes poultry and cattle while pork production is relatively less important. Some factors other than the composition of the nations livestock population must be important.

Grain Use Contrasted

The proportion of grain in livestock rations of the Netherlands and United Kingdom each year from 1961 through 1970 follow divergent and contrasting patterns (Table 15).

Table 15. PERCENTAGE OF GRAIN USED IN LIVESTOCK RATIONS, NETHERLANDS AND UNITED KINGDOM, 1961-70

	U.K.[a/]	Netherlands[b/]
1961-62	65.9	66.1
1962-63	69.3	65.3
1963-64	68.8	63.1
1964-65	70.0	61.0
1965-66	69.9	57.2
1966-67	69.6	48.8
1967-68	71.2	48.4
1968-69	71.0	44.5
1969-70	73.1	34.8

a/ Grains, excluding cereal offals, as percent of total feed concentrates used.

b/ Grains, excluding cereals offals, as percent of total compound feeds. However, compound feeds account for 98 percent of all concentrates fed.

SOURCE: Sturgess, I. M. and Reeves R., The Potential Market for British Cereals, Home-Grown Cereals Authority, Haymarket House, Oxendon Street, London, SW1Y4EF, p. 32.

Perkins, Louise M., EC Imports of Non-Grain Feedstuffs Almost Equal Feed Grain Imports, Foreign Agricultural Trade of the U.S., E.R.S., U.S.D.A., Washington, D. C., July, 1972.

In the United Kingdom not only has the proportion of cereals in the ration increased from 66 percent to 73 percent in the same time span, but the amount of concentrates fed increased from 16,115,000 tons in 1961-72 to 18,293,000 tons in 1969-70.3/

In the Netherlands, the proportion of grain used in compound feeds (98 percent of all concentrates fed) declined steadily from 66 percent in 1961-62 to 35 percent in 1969-70. This means 2,838,000 metric tons of cereals were used out of 4,300,000 tons of compound feeds in 1961-62. In 1969-70 the cereal use amounted to 2,747,710 metric tons out of 7,850,600 tons of concentrates fed to Dutch livestock and poultry.

Factors Encouraging Feed Grain Substitution

There are numerous causes for this shift in the composition of the concentrate ration in the Netherlands. Most important are the relatively high EC grain prices along with the variable levy that protects the EC cereal products from competition from imported cereals. Also there is either a low levy or no levy on by-product ingredients that compete with grains. Included are the cereal offals like corn gluten feed or bran, dehydrated alfalfa, dried beet pulp, dried citrus pulp, processing by-products, and manioc. No levy exists on soybeans or soybean meal.

Also the Dutch have excellent port facilities and low cost water transportation that reduces distribution costs. The feed industry uses computer capabilities to determine least-cost feed combinations within the constraints of nutritional requirements, biological constraints, and feed values of various ingredients.

Under these conditions, the use of the lower energy cost cereal substitutes has been encouraged. For example, there has been a rapid increase in EC imports of low levy dried and pelleted manioc from Thailand and Indonesia. It was priced near $70 per metric ton in mid-1972 at Rotterdam compared to about $95 for barley. Manioc will be used to illustrate the shift from cereals to cereal substitutes and helps explain some of the differential rate of changes shown in Table 15. The increased use of manioc in West Germany, Netherlands and Belgium is due in part to: 1) its lower price relative to barley, wheat or corn, 2) the cost of transportation, and 3) difference in price support levels among regions of the EC.

France has the lowest support prices for cereals and they must use higher transport cost trucks and trains to move cereals out of France or manioc into the grain growing regions. To ship manioc for livestock feed to its interior agricultural region means prices of manioc are above barley prices. Thus, the French feed the lower cost grains to livestock--not the substitutes.

The Italian livestock industry requires the higher truck and train transportation for feed movement from ports. But more importantly, the variable levy on corn for feed use in Italy is $7.50 per metric ton below that of other EC countries. It was estimated that the Italians use more

3/ Sturgess, I. M. and Reeves, R., Ibid, p. 32.

cereals and less by-products than the other nations.

Potential By-Product Substitution by New Entrants

Denmark, Ireland and United Kingdom joined the EC on January 1, 1973. Negotiations provided that the full variable levy be adopted toward third-country imports with internal arrangements for intra-EC trade. Each agreed to adjust their domestic agricultural support prices in six steps to reach the EC level as of January 1, 1978.

The total amount of cereals used in concentrates of all three countries will probably continue to rise, but the relative proportion of cereals in the concentrate ration is expected to trend downward after joining the EC (Table 14). There may be differential rates of change in the three countries.

Let's first examine the prospects for by-products substituting for cereals in the United Kingdom. Little doubt exists that by-product use will increase. There is some question as to how soon, how much and what substitutes.

To discuss substitution for cereals with by-products an understanding of the United Kingdom adjustment from a relative low grain price policy to the EC policy is necessary. The negotiations provided that the price of barley in the United Kingdom would be supported at £27 per ton starting January 1, 1973. Furthermore, the agreement provided six adjustments of £3 per ton in the five years to January 1, 1978. At this time barley prices would be supported at £42 per ton. This would bring the United Kingdom level for barley in line with those of the EC after adjusting for transportation.

Manioc illustrates the potential for substituting by-products for cereals in the concentrate rations in the United Kingdom. The price of manioc in Rotterdam in the summer of 1972 was near £29 per ton. Transportation costs to ports in the United Kingdom at that time amounted to about £3 per ton. In-factory cost may be low to £3 per ton depending upon whether the feed mill is on-dock or located at a non-dock site. Thus, for mills located at the ports, manioc costs may range from £32 to £35 per ton. If these relative prices and costs hold barley would remain a lower cost energy feed ingredient than manioc through 1975 and possibly through 1976.

For those feed mills located at interior locations the additional transportation costs are about £2 per ton. At these locations, the total cost of manioc would have been about £37 per ton in 1972. If prices and costs reain near these levels it would be 1977 before manioc might replace barley in livestock rations.

But these calculations ignore the fact that manioc has virtually no protein and fat. Thus, protein meal and fat must be added to concentrate rations to correct these deficiencies. With the additional and higher per ton costs of protein meal the use of manioc by feed compounding mills will be further delayed.

The trend toward location of feed compounding plants and capacity in

the interior grain and livestock producing locations may or may not continue. If it does, the use of imported manioc likely will be low; even after complete adjustment to EC prices. The tendency of feed compounders and livestock producers in grain producing regions is to emphasize the use of high protein feeds to supplement the locally grown grain. This reduces total transportation costs compared to a complete compounded feed manufactured at port sites.

It must be remembered, the amount of manioc that can replace cereals varies by species of livestock. For poultry, manioc use is very limited, and poultry takes 38 percent of the total concentrates fed.4/ For hogs, manioc can replace only 15 to 20 percent of the cereal component because of its tendency to cause diarrhea. The United Kingdom hog industry uses less than 25 percent of the total concentrates fed. The cattle enterprise can use large quantities of by-products, but the cereal offals and dried pulps are prefered.

The feed compounders and the livestock industry in the United Kingdom have the capability to readily use cereal substitutes and will do so under favorable conditions. Conditions are not, however, so favorable for the use of cereal substitutes as in the Netherlands, Belgium or West Germany.

In Ireland, cost conditions, price support levels, and transportation charges are quite similar to the United Kingdom. They differ in that they produce little grain and they emphasize cattle on grass. It would appear the use of cereal substitutes will grow, but at a lower rate than the United Kingdom.

In Denmark, things are somewhat different. They adjusted price supports for barley upward upon expectation of EC entry. So their five-year adjustment is much less than in Ireland or United Kingdom. With a much higher cereal price they have the opportunity to substitute by-products almost immediately.

In Denmark the relationship between the by-product costs, including additional transportation to Denmark, and the price support level for barley wil be the determinants of by-product use. If by-product substitutes lower feed costs, then Danish producers will use the substitutes for livestock feed and deliver higher priced barley to the price support agency.

4/ Ashby, A. W., Livestock Feed Compounding in the 1970's, ICAM-CAFMNA-SFT Joint Conference, Pillar Hall, Olympia, London, April, 1970.

III. FOREIGN TRADE EDUCATION ACTIVITIES IN OHIO EXTENSION PROGRAM

The Common Market study project findings have been incorporated into the ongoing Ohio extension economic policy and trade program. The world food and feed situation, Russian grain sale and energy crisis has contributed to an explosion in the interest of consumers, news media, businessmen, and farm people in foreign trade and the role trade plays in the domestic economy, price of food, balance of trade and balance of payments. Incorporating facts and observations about the EC, their conditions and policies, has been easy to do and improves the understandings of people about the importance of the EC to U. S. agriculture and the interrelatedness of trade. One of the more important facets of the Common Market project and experiences has been the noticeable improvement in creditability and rapport with various audiences upon discovering that I have actually been there, observed and talked to various interests.

Some aspect of trade was involved in the following set of activities from August, 1972 through July, 1973. In all cases, some references or discussion about the EC experiences were incorporated into the activity,

A. Professional

1. An invited discussion paper entitled, Commodity Trade in the 1970's at the annual American Agricultural Economics Association annual meeting, University of Florida in August, 1972. Estimated attendance was 150 university and business representatives.

2. Above paper printed in the American Journal of Agricultural Economics, December, 1972.

3. Talk on the "Ohio Extension Foreign Trade Program" at the National Extension Workshop on Foreign Trade held at Michigan State University, February 26-March 1, 1973. Conference involved 60 people from various state extension services, U.S.D.A., Department of Commerce and business representatives.

4. Seminar on "Trade--An Emphasis on the Russian Grain Sale" for Ohio State University staff sponsored by Department of Agricultural Economics and Rural Sociology in early October, 1972. There were about 75 people attending with very good attendance from the Slavic Studies Group, College of Business Administration and Agricultural Economics.

B. Ohio Extension In-Service Training

1. In October and November each year, I head up a team of economists that conduct 10 in-service training meetings for Ohio extension agents, vocational-agriculture teachers and selected home economists. Last fall this series of meetings designed to teach the teachers to do the teaching, was attended by 425 professional workers. We develop teaching aids and techniques to demonstrate economic principles. In

the four-hour training period, trade issues and policies (including EC) were an important segment of the instruction. Past evaluations have shown that the extension agents, teachers and others attending these voluntary professional improvement meetings conducted nearly 1,000 meetings around Ohio with nearly 35,000 people, mostly farmers and consumers, in attendance. This says nothing about radio, T.V., news letters, news articles, etc., written by these people. This program upgrades the competencies of our Ohio professional staff and assists greatly in multiplying our personal efforts in disseminating economic facts, policy and trade information. The current food price issue is full of trade questions. This last spring, the Ohio county extension staff was supplied overhead materials prepared by the state staff on the food price issue (including trade) and did a fine job of teaching at the local level.

C. Meetings Emphasizing Trade

1. Business Interests

a. In November and December, 11 area-wide extension meetings were conducted with agribusiness interests (credit, chemical, machinery and other supply-type firms and meat, poultry, grain marketing, processing and exporting firms) in which trade in farm products, Russian Grain sale and EC concerns were involved. There were 720 people at these dinner meetings in which about two hours were devoted to the economic issues influencing their business operations.

b. There were 13 other meetings attended by an estimated 1,950 people where I discussed some aspects of trade. One was the College of Agriculture Alumni Day Conference in March, 1973 in which "Issues in Foreign Trade of Farm Products" was the topic. Carrol Brunthaver, Assistant Secretary of Agriculture, USDA, Conrad Biederman, Research Staff, Continental Grain Company and Wallace Barr (all Ohio State University alumni) were the speakers. State groups addressed included the annual meetings of the Ohio Power and Farm Equipment Dealers, Producers Livestock Association, Ohio Farm Managers and Rural Appraisers, and the Ohio Agricultural Stabilization and Conservation Committee training meeting. The remaining eight were local meetings in which the audiences were business oriented.

2. Clergy

a. One-half day was devoted to teaching in each of two clergy in-service economic education conferences. One was held in September, 1972; the other in February, 1973.

3. Bankers

a. Addressed 250 bankers at the Wisconsin Agricultural Bankers Association's Annual Conference in Madison, Wisconsin, May 2, 1973.

4. Farmers

   a. Participated in 16 meetings in which trade was a major consideration, attended by nearly 1,700 farmers.

D. Meetings Emphasizing Food Prices; Trade A Consideration

1. Participated in 11 meetings in which food prices were the visible issue, but where trade was heavily involved. The audiences were quite variable and included:

   a. The Ohio Food Distribution Conference held March 13-14, 1973, attended by about 200 food processors, wholesalers, and retailers. Most attendees were located in the Eastern part of the U. S.

   b. Youngstown area meeting for mass media on the food price issue. held in July 1973. There were 30 people representing newspaper, radio and TV stations.

   c. Testified at Cleveland City Council hearing held April 17, 1973, or ten days after the meat boycott, on the "producers role in rising meat prices." My presentation on the issue included some trade factors and much of the questioning by the panel was on trade. All three major TV networks in Cleveland -- ABC, CBS, and NBC -- saturated Ohio TV news coverage. Radio and newspaper personnel covered the hearing.

   d. Eight other meetings were attended by 340 people.

E. Articles Written: Trade Included

1. Three articles have been submitted to Phillip Mackie, F.A.S., U.S.D.A. on the Common Market Project. They were entitled: 1) Big Changes in EC Feed Industry, 2) Land Use Shifts and Increasing Cereal Grain Output in EC, 3) Expect More Corn and Cereals in the United Kingdom.

2. An article, "Exports Will Help 1973 Prices," Ohio Farmer, December, 1973.

3. An article, "Prospects for Agriculture Good in 1973," Economic Information for Ohio Agriculture, Ohio Cooperative Extension Service, June, 1973.

4. Article entitled "Mid-Year Gaze at Agriculture's Crystal Ball," Ohio Farmer, June, 1973. This is essentially the same article in E-3.

F. Mass Media

1. Consulting with mass media has been a major activity this past year. Much effort and time was spent with large city newspaper writers on all facets of the food issue, in which devaluation and trade have been

important considerations. Seeking assistance were such newspapers as the Cleveland Plain Dealer, Youngstown Vindicator, Akron Beacon-Journal, Columbus Dispatch, Dayton Daily News, Cincinnati Inquirer, plus personnel from many smaller city papers. Calls lasting one to two hours with one writer were commonplace. There have been frequent repeat calls. The knowledge and creditability displayed as a result of the Common Market project and other foreign assignments have been very helpful.

2. Trade questions were involved on a one-hour "hotline" program on rising food prices by Columbus, WTVN-6. A restauranter, a consumer meat boycotter and I comprised the panel.

C. 1973-74 and Beyond

The experience, information and observations gained from the 1972 Common Market project will be useful in the year(s) ahead. As new issues emerge, or old ones are renewed from the current world food and feed situation. The appropriate use of relevant information about the EC and its changing policies, production, and trade will be incorporated into the Ohio extension education program on foreign trade. For example, as GATT negotiations develop they can and will be incorporated into the Ohio program. The payoff period for the FAS sponsored project Contract No. 12-29-72-8 will be quite long.